Claims

1. A vaccine composition which is protective against equine arterivirus (EAV) infections in horses and induces a cellular immune response, comprising a open reading frame nucleic acid (ORF) 2, ORF 5 and/or ORF7 of EAV.
2. The vaccine composition according to claim 1, wherein said vaccine composition comprises ORF 2, ORF 5 and ORF7 of EAV.
3. The vaccine composition according to claim 1, wherein said vaccine composition further comprises one or several ORF(s) selected from the group of ORF 1a, ORF 1b, ORF 3, ORF 4, ORF 6.
4. The vaccine composition according to claim 1, wherein said nucleic acid is cDNA.
5. The vaccine composition according to claim 1, wherein said vaccine composition comprises one or several nucleic acid vectors each comprising said ORF or ORFs.
6. The vaccine composition according to claim 5, wherein said vector(s) is/are expression vector(s).
7. The vaccine composition according to claim 6, wherein said expression vector(s) comprise(s) a eukaryotic cis-acting transcription/translation sequence functionally linked to said ORF(s).
8. The vaccine composition according to claim 7, wherein said expression vector is selected from the group of pCR3.1, pcDNA3.1/His A, pcDNA3.1/His B, pcDNA3.1/His C, and pDisplay (pD).
9. The vaccine composition according to claim 1, further comprising the nucleic acid encoding equine interleukin 2 (IL-2) or a vector or expression vector comprising said nucleic acid encoding IL-2.
10. The vaccine composition according to claim 1, further comprising pharmaceutically acceptable carrier or excipient.
11. The vaccine composition according to claim 1, further comprising one or several adjuvants selected from the group of Muramyl Dipeptide (MDP), Montanide 720, Poly Inosine:Cytosine (Poly I:C) or plasmid DNA comprising unmethylated cytosine, guanine dinucleotide sequence motifs (CpG).

12. The vaccine composition according to claim 1, consisting of expression vectors comprising ORF2, ORF5 and ORF7 of EAV, respectively, and optionally carrier, excipients or adjuvants and an expression vector comprising the nucleic acid encoding IL-2.

13. The vaccine composition according to claim 1, wherein ORF 2 is SEQ ID No. 2, ORF 5 is SEQ ID No. 5 or SEQ ID No. 9 and ORF 7 is SEQ ID No. 7.

14. The vaccine composition according to claim 1, wherein the nucleic acid or nucleic acid vector or expression vector is encapsulated into cationic liposomes.

15. A nucleic acid vector comprising nucleic acid selected from the group of ORF 1a, ORF 1b, ORF 2, ORF 3, ORF 4, ORF 5, ORF 6 and/or ORF7 of EAV.

16. The nucleic acid vector according to claim 15, wherein said nucleic acid is DNA.

17. The nucleic acid vector according to claim 15, wherein said nucleic acid vector is an expression vector.

18. The nucleic acid vector according to claim 17, wherein said expression vector comprises a eukaryotic cis-acting transcription/translation sequence functionally linked to said nucleic acid(s) specific for said ORF(s).

19. The nucleic acid vector according to claim 17, wherein said expression vector is selected from the group of pCR3.1, pcDNA3.1/His A, pcDNA3.1/His B, pcDNA3.1/His C, and pDisplay (pD).

20. The nucleic acid vector according to claim 15, wherein said nucleic acid vector comprises a nucleic acid selected from the group of SEQ ID No. 2, SEQ ID No. 5, SEQ ID No. 9 and/or SEQ ID No. 7.

21. A method for prophylaxis or treatment of EAV infection in a horse, comprising

(i) coating one or several nucleic acid vector(s) according to any one of claims 15 to 20 onto carrier particles;

(ii) accelerating the coated carrier particles into epidermal cells of the horse *in vivo*; and

(iii) inducing a protective or therapeutic immune response in said horse upon or after exposure to EAV; and

(iv) monitoring the reduction of EAV-associated symptoms or the reduction of horizontal or vertical transmission.

22. The method according to claim 21, wherein the carrier particles are gold.

23. A method for prophylaxis or treatment of EAV infection in a horse, comprising

(i) injecting a vaccine composition according to claim 1 or one or several nucleic acid vector(s) according to any one of claim 15 into muscular cells of the horse *in vivo*; and

(ii) inducing a protective or therapeutic immune response in said horse upon or after exposure to EAV, and

(iii) monitoring the reduction of EAV-associated symptoms or the reduction of horizontal or vertical transmission.